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REMARKS

Claims 1-6, 12, 13, 17, 18, 20, 21, and 27-29 remain pending.

In the Final Office Action, the Examiner rejected claims 1-6, 13, 17, 18, 20, 21, and 27-29 under 35 U.S.C. § 103(a) as being unpatentable over Hwang et al. (U.S. Patent No. 5,987,120) in view of Albouy (U.S. Patent No. 4,540,853); and rejected claim 12¹ under 35 U.S.C. § 103(a) as being unpatentable over Hwang et al. in view of Albouy, and further in view of Bijman et al. (U.S. Patent No. 6,590,973).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See M.P.E.P. § 2143.

Applicants respectfully traverse the § 103(a) rejection of claims 1-6, 13, 17, 18, 20, 21, and 27-29 over Hwang et al. in view of Albouy. Independent claims 1, 4, and 20 require a circuit, method and apparatus including, *inter alia*, "a low pass filter." Independent claim 13 requires a method including, *inter alia*, "filtering out a polarity reversal that lasts shorter than a defined time." The combination of Hwang et al. and Albouy, even if it were proper, fails to teach or suggest all elements of the claimed circuit, method and apparatus.

Claims 1, 4, and 20:

On page 2 of the Final Office Action, transistor 59, resistor 591, and capacitor 592 in Fig.

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1 of Hwang et al. are alleged to correspond to the claimed low pass filter. These three components of Hwang et al., however, do not reasonably correspond to the claimed low pass filter.

It is axiomatic that low pass filters do not output high frequencies. See, for example, Appendix A ("Engineering Electronics: A Practical Approach," Robert Mauro, pp. 410 and 411), Figure 7.4-1(a). Any frequencies above the cutoff frequency f_c (i.e., in the stopband) are attenuated to zero. It is equally axiomatic that sharp signal transitions in time contain very high frequencies. This high frequency content extends to infinity, with or without a drop-off in magnitude, as illustrated in Appendix B (Aligent Product Note 54600-4, p. 2), Figures 2(d) and 2(f). Thus, if a series of components passes a sharp signal transition without alteration, it follows that no high frequencies are removed, and that the components are not a low-pass filter.

Bearing this in mind, please refer to Appendix C, which illustrates Fig. 2 from Hwang et al. Signal A illustrates the input to components 59, 591, and 592, and signal C illustrates the output of these components. Positive, sharp transitions 210, 220, 230, 240, and 250 at node A are mirrored exactly by negative, sharp transitions 215, 225, 235, 245, and 255 at node C. This is because transistor 59 turning on allows the instantaneous discharging of capacitor 592. The very high frequencies at transitions 210, 220, 230, 240, and 250 at node A are present and *unaltered* at transitions 215, 225, 235, 245, and 255 at node C.

Thus, components 59, 591, and 592 fail to remove the high frequencies at transitions 210, 220, 230, 240, and 250, and they do not reasonably correspond to the claimed "low pass filter." For at least these reasons, the combination of Hwang et al. and Albouy fails to teach or suggest at

¹ Claim 7 was canceled by the Amendment filed September 9, 2004.

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least the low pass filter set forth in claims 1, 4, and 20.

Claim 13:

Regarding independent claim 13, contrary to the allegations on pages 4 and 7 of the Office Action, the circuit in Fig. 1 of Hwang et al. does not “filter[] out a polarity reversal that lasts shorter than a defined time” as claimed. The Examiner’s argument on page 7 begins correctly by noting that the impulse on T/R is turned into a pulse (e.g., at 210 in Appendix C) at node A, but then proceeds to ignore the rest of Fig. 2. This pulse at node A is turned into a more spread-out signal (e.g., at 215 in Appendix C), which is truncated somewhat at node B. The key, actual teaching of Fig. 2 of Hwang et al. is that the impulse on T/R is *not* “filtered out” as claimed, because corresponding signals are present at each of nodes A, B, and C. Thus, the circuitry in Fig. 1 is not “filtering out a polarity reversal” at all.

Nor can Fig. 1 reasonably be said to be “filtering out a polarity reversal that lasts shorter than a defined time,” because the impulse on T/R is already extremely short, and Fig. 1 fails to filter it out. For at least these reasons, the combination of Hwang et al. and Albouy fails to teach or suggest at least the “filtering out . . .” set forth in claim 13.

Because the combination of Hwang et al. and Albouy fails to teach or suggest all elements of claims 1, 4, 13, and 20, a *prima facie* case of obviousness has not been established for these claims.

No motivation to combine:

A *prima facie* case of obviousness also has not been established for claims 1, 4, 13, and 20, because no motivation or suggestion has been shown to combine Hwang et al. and Albouy. Page 3 of the Final Office Action provides only a bare conclusion of obviousness. No evidence

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from either reference or other technical reasoning has been provided to support this conclusion. Without any supporting evidence or facts, a *prima facie* case of obviousness cannot be established. See M.P.E.P. § 2142 (“The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness.”). A *prima facie* case of obviousness also has not been established for claims 1, 4, 13, and 20 for at least this additional reason.

In reply, and instead of providing any factual support, the Examiner argues on page 7 that because Hwang et al. does not provide details of Schmitt trigger 58, “one of ordinary skill in the art would have had to find a teaching such as Albouy in order to even practice the invention of Hwang.”

First, the Examiner fabricates a “problem” that simply does not exist. Schmitt triggers as such are notoriously well known in circuit design, and any of several possible designs are readily available to designers (see, e.g., the Schmitt trigger designs in Appendices D (Fairchild Semiconductor Application Note AN-140, June 1975) and E (found at http://www.play-hookey.com/digital/experiments/rtl_schmitt.html)). Alternately, one of ordinary skill would simply use a prefabricated Schmitt trigger, such as that shown in Appendix D. Rather than “hav[ing] to find a teaching such as Albouy,” it is much more likely that one of ordinary skill in the art would have used his common design knowledge or used an off-the-shelf design for Schmitt trigger 58 in Hwang et al.

Even if one of ordinary skill did have to go searching for a Schmitt trigger design, the Examiner has pointed to no need or other motivation for one of ordinary skill to look to Albouy. Here, Applicants specifically traverse the unsupported assertion on page 2 of the Final Office Action that “Albouy teaches the standard construction of an analog-to-digital Schmitt trigger.”

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Appendices D and E each teach a Schmitt trigger construction that does not include a differential amplifier. The Examiner has provided, and can provide, no evidence why one of ordinary skill in the art would have chosen the Schmitt trigger design in Albouy over any of the other myriad of possible Schmitt trigger designs. Such lack of evidence means that a *prima facie* case of obviousness still has not been established for claims 1, 4, 13, and 20.

Because a *prima facie* case of obviousness has not been established for claims 1, 4, 13, and 20, the § 103(a) rejections of claims 1, 4, 13, and 20 are improper and should be withdrawn. Claims 2, 3, 5, 6, 17, 18, 21, and 27-29 are allowable at least by virtue of their dependency from claims 1, 4, 13, and 20.

Regarding the rejection of claim 12, the addition of Bijman et al. fails to cure the deficiencies in Hwang et al. and Albouy noted above with respect to claim 4. Bijman et al. also fails to teach or suggest the low pass filter element of claim 4, and its addition cannot establish a *prima facie* case of obviousness for this claim.

Reconsideration and allowance of pending claims 1-6, 12, 13, 17, 18, 20, 21, and 27-29 are respectfully requested.

In the event that any outstanding matters remain in this application, Applicants request that the Examiner contact Alan Pedersen-Giles, attorney for Applicants, at the number below to discuss such matters.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-0221 and please credit any excess

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fees to such deposit account.

Respectfully submitted,

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